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The psychosocial consequences of the Fukushima disaster: What are we suffering from?

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Abstract

The Fukushima Daiichi Nuclear Power Plant accident caused enormous damage in terms of not only the mental status of affected people, but also the cohesiveness of entire communities in Fukushima Prefecture. Regarding individual mental health, many psychiatric issues became apparent after the accident, including, but not limited to, posttraumatic stress disorder, depression, and alcohol or another type of substance abuse. Widespread rumors and damaged reputations caused anxiety among residents and evacuees, eliciting various disparities such as risk perception factors related to compensation or the effects of radiation exposure. As a result, a decrease in community resilience was observed. Additionally, evacuees were frequently exposed to public stigmas resulting from the negative stories regarding compensation issues or the possible genetic effects of radiation exposure. To address these multidimensional mental health problems, several new and unique care facilities were established after the disaster with the aim of providing active interventions for and improving the current well-being of affected people, including evacuees. While a certain level of effectiveness in the provision of outreach services has been seen, issues such as burnout and exhaustion among health care staff working for different care resources have also been observed. In contrast to natural disasters, nuclear disasters tend to have long-term psychosocial consequences on affected people. Therefore, support care resources that could play important roles, especially in the post-disaster phase in affected areas, should be

supported by national and local governments on a long-term basis.

Keywords: nuclear disaster, posttraumatic accident, depression, stigma, risk communication

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Introduction

On March 11, 2011, a massive earthquake and tsunami struck the Tōhoku region of Japan, resulting in serious damage, especially across Iwate, Miyagi, and Fukushima Prefectures. Furthermore, the tsunami crippled the cooling system at the Fukushima Daiichi Nuclear Power Plant (FDNPP), leading to serial explosions in all four reactor buildings. This subsequent nuclear accident caused not only direct physical loss and damage, but also long-term psychosocial effects on residents across the entire Fukushima region.

Within a month after the accident, about 140,000 people were voluntarily or involuntarily evacuated to different locations inside and outside of Fukushima Prefecture. The evacuees aimlessly traveled from place to place in an attempt to avoid exposure to radiation. It is currently estimated that the evacuees changed their location approximately four times on average during the first year after the disaster (Yabe et al. 2014). In the acute phase of the accident, most of the evacuees believed that their relocation was only tentative and that they would be able to return to their homes soon, possibly within several weeks or months. However, the information conveyed by the Japanese government during the acute phase of the accident was often vague and unclear, and this was amplified by differences in opinions among numerous “experts” toward the possible adverse health effects of radiation exposure. Inaccurate and insufficient information about the radiation risk made an already bad situation even worse. Moreover, various additional factors that were originally unrelated to the health effects of radiation exposure, such as political opinions towards nuclear policy in Japan, contributed to the initial confusion and uncertainty among evacuees and those who had decided to stay in the Fukushima area.

Looking back at the situation, the people affected by the Fukushima disaster seemed to be suffering from the effects of baseless rumors and accusations and unfounded suspicions fostered by the so-called “experts” rather than from the direct effects of the tsunami and subsequent nuclear accident. Information on the Internet had an immensely negative effect on the evacuees’ judgements and decisions regarding whether to return home and helped shape negative public attitudes and stereotypes about those affected by the disaster as well as the general image of the Fukushima area and its products both inside and outside Japan. A recent report published by a well-known think tank in Japan (Yoshizawa et al. 2017) revealed that over 40% of the people living in Tokyo were still worried about the possible adverse genetic health effects of radiation exposure from the Fukushima accident; many of the respondents reported obtaining their

information and knowledge from the Internet only, rather than from Japanese governmental sources, scientific publications, or other official sites such as academic societies or international organizations, such as the International Atomic Energy Agency (IAEA), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEA), and the International Commission on Radiological Protection (ICRP), which are supposed to play major roles in safety and protection against ionizing radiation after rare events such as major nuclear accidents (Tanigawa et al. 2016).

In this chapter, we first describe the various types of psychological consequences that emerged after the Fukushima disaster, such as posttraumatic stress disorder (PTSD), grief, and loss reactions. Second, we examine the psychosocial issues evoked among evacuees and affected communities, such as the negative influence of mass media and the resultant stigmas and self-stigmas. Third, to identify the multidimensional stressors affecting numerous survivors of the Fukushima disaster, a concrete example is provided. Finally, we briefly discuss some of the current important challenges in Fukushima Prefecture that remain to be met. It is our sincere hope that the lessons that can be learned from the Fukushima disaster will be helpful after any potential nuclear crisis in the future.

Current psychiatric issues in Fukushima Prefecture

Posttraumatic responses and depressive symptoms

In 2011, people living in Fukushima Prefecture were exposed to an unfortunate series of complex traumatic events: a massive earthquake followed by a historic tsunami and subsequent nuclear disaster. These events caused substantial trauma among those living in the affected area, such as evacuees, leading to PTSD in many, the symptoms of which include but are not limited to the avoidance of places, people, and certain activities, emotional numbness or re-experiencing the traumatic event, for example, through flashbacks and nightmares followed by hyperarousal and altered arousal responses.

In addition to numerous posttraumatic symptoms, persistent fear and worry related to radiation exposure and food and water contamination negatively affected general public opinion, with the strongest fears and anxieties still prevailing both inside and outside of Fukushima Prefecture, especially among women and mothers (Kimura 2016). Despite the tremendous human and financial costs, as well as the dedicated resources to the recovery process that were supplied by the Japanese government (Sato & Lyamzina 2018) and the gradual lifting of evacuation orders and reopening of a number of affected areas, many evacuees were still hesitant to return to their hometowns because of

continuous groundless rumors, baseless accusations, unfounded suspicions, and widespread stigma toward the area, its products, and the evacuees themselves. As a result, as of August 2017, there were still around 58,000 evacuees (Fukushima Prefectural Government 2017).

Since February 2012, Fukushima Medical University (FMU) has been conducting major population-based mental health surveys (the Mental Health and Lifetime Survey; MHLS) involving approximately 210,000 people who had previously lived in the evacuation area (Yasumura et al. 2012). In these surveys, questionnaires, including a version of the PTSD checklist for specific stressors (PCL-S) (Iwasa et al. 2016), were mailed to the targeted population annually. The findings showed that 21.6% of the adults surveyed scored above the cutoff value (≥ 44) on the PCL-S at 10 months after the disaster, which is almost equal to that of workers after the 9/11 World Trade Center attacks in the United States (Stellman et al. 2008). In another recent report on the same population, over 10% of the respondents still showed symptoms of PTSD (MHLS 2018).

In addition to PTSD, the results of the MHLS, which were based on the 6-item Kessler scale (score ≥ 13), showed that the prevalence of probable depression among adult evacuees was as high as 14.6% in 2012, 11.9% in 2013, and 9.7% in 2014 (Oe et al. 2016). Despite this gradual decrease, the scores were still considerably higher than those of the general Japanese population (3%) (Kawakami 2006). In addition, the prevalence of depressive symptoms over the most recent 3 years has been approximately 7% (MHLS 2018), which could indicate a prolonged course of depression. In addition, a 3-year MHLS trajectory analysis revealed that a negative risk perception regarding the genetic effects of exposure to radiation was strongly associated with depressive symptoms (Oe et al. 2016).

Moreover, public employees working in disaster-affected areas are likely to be considerably exhausted and depressed. In fact, one study (Maeda et al. 2016) revealed that the current prevalence of depression among all workers belonging to two towns in the coastal area of Fukushima was as high as 17.8%. Both the provision of adequate psychiatric interventions and the establishment of an efficient care system for these workers are urgently needed.

Suicide and related-issues

The high prevalence rates of people at increased risk for depression and PTSD as described above could result in more serious outcomes such as an increase in the suicide rate. Actually, in Fukushima Prefecture, 101 cases of suicide during the 7 years after the Fukushima disaster were officially certified as disaster-related by the Japanese Police

Agency (Japanese Cabinet Office 2017); this rate is much higher than that reported in other prefectures such as Iwate and Miyagi, which were mainly affected by the tsunami (Japanese Cabinet Office 2017). Furthermore, initially, the standardized suicide mortality ratio (SMR) decreased gradually after the 2011 disaster (108 in 2010, 107 in 2011, 94 in 2012, and 96 in 2013), but then increased to 126 in 2014, exceeding pre-disaster levels (the reference of the SMR is the average suicide rate among the general population in Japan) (Ohto et al. 2015). This pattern, an increase after a short-term drop, is similar to that noted in a review by Kölves et al. (2013). Furthermore, another study analyzing panel data from Fukushima Prefecture revealed that male and female suicide rates in evacuation areas increased 3 and 4 years after the disaster, respectively, which differs from rates in other areas within the same prefecture (Orui et al. 2018). Such a substantial increase in suicide cases in Fukushima Prefecture could conceivably be the result of the effects of the nuclear power plant accident, rather than those of the earthquake or tsunami. In other words, the decrease in community resilience in Fukushima Prefecture might have caused an increase in suicide attempts.

Another psychiatric problem related to suicide and often seen after natural disasters is alcohol abuse (Beaudoin et al. 2011; Cerdá et al. 2011). The MHLS showed that the recent prevalence rate of problem drinking according to CAGE (an acronym for “attempts to Cut back on drinking, being Annoyed at criticisms about drinking, feeling Guilty about drinking, and using alcohol as an Eye opener”) scores remained relatively high in both males (17.1% in 2017) and females (9.2% in 2017) (Oe et al. 2016). In spite of the lack of CAGE data from the general population in Japan, these findings suggest that primary prevention strategies need to be prioritized for people at increased risk of both alcohol abuse and suicide.

Social responses to the Fukushima accident

Turmoil in the initial phase

Any natural or man-made accident is associated with complications in the initial stage of the crisis. The Great East Japan Earthquake, which was followed by the subsequent tsunami and nuclear crisis, was no exception. At first, the earthquake caused critical structural damage with implications for seismic safety at several nuclear power plants in Japan, after which, the tsunami crippled the backup electric generators at the Fukushima Daiichi Nuclear Power Plant, disabling its cooling systems and consequently causing a meltdown and a large hydrogen explosion at the power station (Kingston 2012). Subsequent failures in communication resulted in poor crisis management by Tokyo

Electric Power Company (TEPCO) and the Japanese government, undermining the credibility of both organizations and causing deep public distrust toward the government, as well as the stigmatization of the entire Fukushima region, multidimensional psychological and social issues among the affected population, and misinformation and contradictory messaging from the mass media, which led to additional widespread groundless rumors across Japan.

The term *fuhyohigai* in Japanese refers to the damage induced by rumors and negative stigmas regarding the people and products affected by the Fukushima disaster, which still prevail within the discourse of the mass media and social networking service (Hirakawa & Shirabe 2015). Those who live outside the disaster-stricken area are mostly exposed to harmful and groundless rumor-related media coverage, which ultimately causes *fuhyohigai* both inside and outside of Japan. Initially, the term *fuhyohigai* was mainly used to describe economic damage; however, since the disaster, it has also been used in regard to post-disaster psychological damage (Sekiya 2011).

Social stigma and media coverage

The mass media are known to play a very important role, such as delivering information to a large number of people simultaneously. Therefore, the mass media usually play one of the major roles in framing and interpreting certain risks, and consequently, directly or indirectly affecting perceptions of different risks among affected populations (Vyncke et al. 2016). In addition, “risks from activities that receive considerable media coverage (e.g., such as accidents and leaks at nuclear power plants) are judged to be greater than risks from activities that receive little attention (e.g., on-the-job accidents)” (Covello & Sandman 2001). After the Chernobyl disaster in 1986, Soviet scientists proved that the way the mass media reported the accident played a major role in the development of post-Chernobyl mental disorders among the affected population in Ukraine, Belarus, and Russia (Lazarev 1999). Fukushima, similar to Chernobyl, was no exception in this regard, and currently faces nearly identical consequences. Just like in case of Chernobyl, the affected Japanese public received substantial amounts of misinformation that often contained inaccurate and contradictory messages (Tomkiv et al. 2016). As a result, distrust intensified toward the institutions responsible for the crisis, causing stigma, panic, fear, anxiety, distorted perceptions of radiological risk, and multidimensional social and psychological problems.

Actually, large amounts of evidence can be found in the responses of people who took part in the MHLS. Many affected people described their psychological distress as being related to self-stigmatization, with a focus on both public and self-stigmas. Analyzing

their responses, we found two types of stigma-related behaviors among evacuees: “passing” behavior and “covering” behavior, which were devised by the Canadian–American sociologist Ervin Goffman in 1969. Some people were trying to hide their real life stories because they experienced the FDNPP accident firsthand. These people were also afraid that the general public might look down on them because of compensation issues and groundless radiation health-related assumptions. One such example is provided below:

“My car license plate was issued in “Iwaki city”. So, when someone asks me “are you an evacuee?”, my heart starts pounding. I feel that some people envy me because of the possible financial compensation benefits provided by TEPCO; therefore, I cannot answer them honestly. It’s quite frustrating...” (Anonymous answer from an evacuee in Fukushima Prefecture).

Additionally, one shocking event was broadly reported by the press in November 2016, shedding some light upon the public stigma regarding evacuees in Japan and its psychological impact. For example, a 13-year-old boy was bullied in an elementary school in Yokohama city for being a “nuclear evacuee” from Fukushima. He was called “germ” as a reference to nuclear contamination by his teacher and was forced to pay over ¥1.5 million (\$13,500) in extortion fees to his bully classmates (The Japan Times, January 1, 2017).

“I am disturbed by media reports about bullying cases related to the nuclear disaster involving evacuees from Fukushima at primary schools. What if my son were in the same situation, what should I do? We have been asking our schoolteachers to keep it a secret that we are evacuees from Fukushima Prefecture. However, I am afraid that our secret will be discovered by students or their parents.” (An evacuee living outside Fukushima Prefecture).

A scientific study conducted among people suffering from chronic psychiatric disorders such as schizophrenia showed that self-stigmas caused by public stigmas often made such persons more anxious and unstable, and could even reduce self-efficacy and self-esteem (Corrigan et al. 2006). In Fukushima, we have attempted to apply the Stage Model of Self-Stigma proposed by Corrigan et al. (2012) to evacuees (Figure 1). Similar to people with chronic psychiatric disorders, evacuees who are exposed to public stigmas as described above will also most likely experience self-stigmas, and thus more likely to

have decreased self-efficacy and suffer from depression and PTSD (Maeda et al. 2015).

[Figure here]

Case

Below we describe a typical case of an evacuee considered to be suffering from the multidimensional stressors described above (the evacuee's real name and data have been modified to maintain confidentiality).

“Mariko is a 35-year-old woman. When the accident took place, she lived in a town located about 20 km from FDNPP with her husband (car engineer) and two children. Immediately after the accident, they were forced to evacuate in great confusion to several places, including Tokyo. At first, they were confident that it was just a temporary situation and that they would be able to return to their home very soon. However, after moving several times to different locations, they realized that they would not be able to return home as they had expected, but would have to remain evacuees for a long time. Mariko felt very disappointed because of the situation, despite the fact that her family had begun living in a tentative house in Fukushima Prefecture and was attempting to start a new life.

Mariko's husband was unable to find a new job, and as a result, started playing Pachinko (Japan's biggest gambling obsession) every day. Because they had started receiving fixed financial support from TEPCO, they were able to avoid bankruptcy; however, Mariko had great concern about her and her family's future and the possible adverse health effects resulting from exposure to radiation, especially in terms of her children. She started checking the Internet repeatedly every day to search for information about the possible effects of radiation exposure. Rather than becoming relieved, the large amount of information she found from various social media sources made her even more scared and anxious, as much of the information she had obtained was based on groundless and exaggerated rumors.

In particular, she was most deeply concerned about her children's outdoor activities. She soon began forbidding her kids to touch the ground, leaves, or plants while playing outdoors. As a result, her children preferred to stay indoors and started overeating and playing video games only, which ultimately led to obesity.

Luckily, four months after the accident, her husband found a new job and started working for an automobile factory. However, considering her fear for her children's health, Mariko maintained strong hope that they could leave Fukushima Prefecture and move to Osaka, where she was born and raised. However, Mariko and her husband started arguing with each other frequently because they disagreed about whether to stay or leave Fukushima. Eventually, as a result of this conflict, Mariko decided to separate from her husband and leave Fukushima with her children.

In Osaka, Mariko and her children started a new life. However, she constantly felt afraid and anxious that other people might hold some negative feelings against her or her children due to the fact that they had experienced the FDNPP accident, so she tried to hide her real life story. She was also very worried that her children might be bullied at school by their classmates because they were Fukushima evacuees.

Although she faced a lot of troubles, she still hesitated to talk about them with other people in her new surroundings in Osaka. Gradually, she became increasingly nervous and started having sleeping difficulties for three or more days per week. Additionally, her constant negativity about her and her family's hopeless future was taking its toll. She started blaming herself for everything: "I could not protect my children or my husband... I have caused a lot of trouble to everyone...Every day, I feel that I am worthless, that I am ugly". Finally, she started thinking about suicide more frequently and even making actual plans for an attempt. Eventually, Mariko's husband became worried about her unusual and suspicious behavior, so he came to Osaka to meet her and convinced her to visit a psychiatric clinic. Luckily, Mariko started psychiatric treatment about 8 months after the accident".

Mariko was forced to evacuate without any physical and mental preparation for the natural disaster followed by the nuclear crisis. All she wanted was to be able to settle down in a new and safer place. The large amount of information regarding the possible adverse effects of radiation exposure on health only served to confuse her, making it impossible to clearly distinguish between truth and falsehoods and thereby decide on future plans. In particular, she was very concerned about the possible negative consequences of radiation exposure to her children; this resulted in serious conflict with her husband and eventually a marital crisis. Her guilty feelings about her children and husband induced severe depressive symptoms; however, luckily, she decided to follow her

husband's recommendation and undertake psychiatric treatment. This case is typical of the psychological distress experienced by many evacuees, especially young mothers, after a disaster. Unfortunately, unlike in this case, because of the widespread prejudice common towards psychiatric disorders and their treatment, in reality, only limited numbers of evacuees actually visited a psychologist or psychiatric clinic after the disaster.

Current available care resources in Fukushima and remaining challenges

Japan is affected by numerous natural disasters, including regular earthquakes, tsunamis, and typhoons, so physical and psychological suffering after a disaster is not uncommon. Despite causing traumatic experiences, such natural events seem to enhance community resilience and in many cases, strengthen the bonds between residents. In recent decades, knowledge about PTSD has increased, and recently, many people affected by different types of disasters in Japan have had the opportunity to receive quality physical and psychological health care, treatment, and support.

In fact, after the Great East Japan Earthquake and nuclear accident, many different organizations, including nongovernmental organizations, have emerged to provide psychological support and health care to affected residents and evacuees. In terms of recent activities, two major new facilities were established after the disaster: the Radiation Medical Science Center (RMSC) at FMU and the Fukushima Center for Disaster Mental Health (FCDMH). The authors of this chapter have been deeply engaged in the activities of both institutions.

RMSC

The RMSC at FMU was established in 2012 with the objective of carrying out the "Fukushima Health Management Survey", which consists of a basic survey that aims to estimate radiation dose and four additional detailed surveys, namely a thyroid ultrasound examination, a comprehensive health check, the MHLS, and a pregnancy and birth survey (Yasumura et al. 2012).

Specifically, the MHLS aims to identify people at risk of a number of psychiatric disorders, such as depression and PTSD, as well as secondary and lifestyle-related issues, such as a lack of physical exercise, alcohol abuse, smoking habits, and obesity. The MHLS uses several different questionnaires which are mailed annually to about 210,000 people living in the evacuation zone across Fukushima Prefecture. After identifying people who

have some psychological and/or lifestyle-related problems, brief interventions are usually provided through telephone consultations. In some cases, when a telephone intervention is not possible or the respondent experiences relatively minor challenges, leaflets containing material that provides information about mental health issues among other various problems are sent to the recipients. Thanks to the efforts of both institutions, since 2012, about 3,000–5,000 people every year have received psychological support (Kashiwazaki et al. 2016).

Some important statistical data obtained via the MHLS have already been reported in this [article](#); therefore, we would now like to describe the actual telephone interventions provided, when necessary, after the MHLS. For efficient interventions, the RMSC set up a professional support team composed of 15 counselors with extensive field experience in clinical psychology, social work, and nursing care. During the telephone interventions, the respondents, who are identified as being at increased risk for mental health problems, are typically asked about their recent health condition and related habits. In many cases, the counselors provide useful advice and suggestions to ease the troubles or stress experienced by the respondents. If necessary, the counselors can also refer the respondents to appropriate experts or health care facilities (e.g., psychiatric clinics, local health centers). On average, the telephone counselling sessions last 10–30 minutes each. In addition, the time needed to contact each individual identified as being in need of intervention takes around 3 to 4 months (Kashiwazaki et al. 2016).

This unique telephone counselling intervention has several limitations. First, the MHLS currently has only one professional team consisting of 15 people who are adequately skilled to conduct direct visit services and/or face-to-face interviews. Considering the fact that there are still around 58,000 remaining evacuees across and outside Fukushima Prefecture (Fukushima Prefectural Government 2017), and that over 10,000 people are still estimated to be at risk of mental health disorders in the evacuation area, telephone counselling seems to be the best of only a few feasible ways to provide support. The current RMSC team is attempting to establish a network across different health care facilities, such as psychiatric clinics and local health care centers, in order to disseminate necessary information and reach as wide an audience as possible so that existing staff limitations can be overcome and health care can be provided for all evacuees in need.

FCDMH

The FCDMH was also established in 2012, and like the MHLS, is fully funded by the Japanese government. The major role of the FCDMH is to provide mental health care support to affected people living in Fukushima Prefecture. Pre-disaster care facilities

across Fukushima Prefecture were not able to provide adequate support, mainly because of the shortage of human resources. Currently, the FCDMH employs about 40 mental health care professionals, including clinical psychologists, social workers, nurses, and other mental health specialists. To cover the broad area affected by the nuclear accident, the FCDMH currently has branches in the following five locations: Fukushima, Koriyama, Minamisōma, Aizuwakamatsu, and Iwaki (Maeda et al. 2014).

The FCDMH, in cooperation with local residences, is attempting to provide a wide range of activities, including various types of interventions such as outreach services (home visiting services), psychological education, and relaxation methodology. Upon the establishment of the FCDMH, the initial situation in the affected area was extremely complicated and confusing. It was not easy for many of the FCDMH staff to establish a good working relationship with evacuees, and the preexisting health care facilities in the region were lacking because no one had any experience in how to deal with people suffering from the anxieties caused by a nuclear crisis. The professionals at the FCDMH had to learn gradually through trial and error. However, thanks to their continuous efforts, they succeeded in convincing those at the preexisting facilities and other stakeholders in the region to recognize and acknowledge the FCDMH as one of the most useful and important care resources currently available in the region to provide the health care and support necessary for evacuees (Maeda et al. 2014).

Despite the fact that the FCDMH is conducting different types of activities, as mentioned above, the most valuable activities have been the outreach and visiting services. On average, between 4,000–5,000 affected people annually are directly visited by the FCDMH staff for support in cooperation with municipal governments. Urgent crisis interventions are typically provided on a priority basis when people at risk of serious mental health problems and/or suicide are identified. These professionals usually attempt to conduct risk assessments, share information with other care facilities, and recommend that the people at risk visit a nearby psychiatric clinic. In recent years, in addition to the prior focus on evacuees, the professional staff at the FCDMH have also started to provide mental health care support to many public employees working at different municipal offices who face burnout owing to the challenges related to the recovery activities in the remaining disaster-affected areas.

While these efforts have gradually produced good results, new and more difficult and diverse challenges and demands that seem to be beyond the capabilities of local preexisting health care facilities, are being encountered. Stressful long-term assignments at the FCDMH have gradually exhausted some of the staff, and as a result, many professionals leave the FCDMH after several years. Therefore, to adequately

address the mental health care needs of affected populations, it is important for both the government and policy makers alike to realize that specialized mental health care facilities are indispensable after a major disaster, such as a nuclear accident, and should be operated for a long time (a minimum of 10 years). Local staff who carry the bulk of the burden in providing actual mental health care and support also require continuous support from national and local governments, who should ensure a stable working environment for workers, continuous training, and adequate financial remuneration to maintain the required number, as well as the morale and continuous interest, of professional staff in the mental health field.

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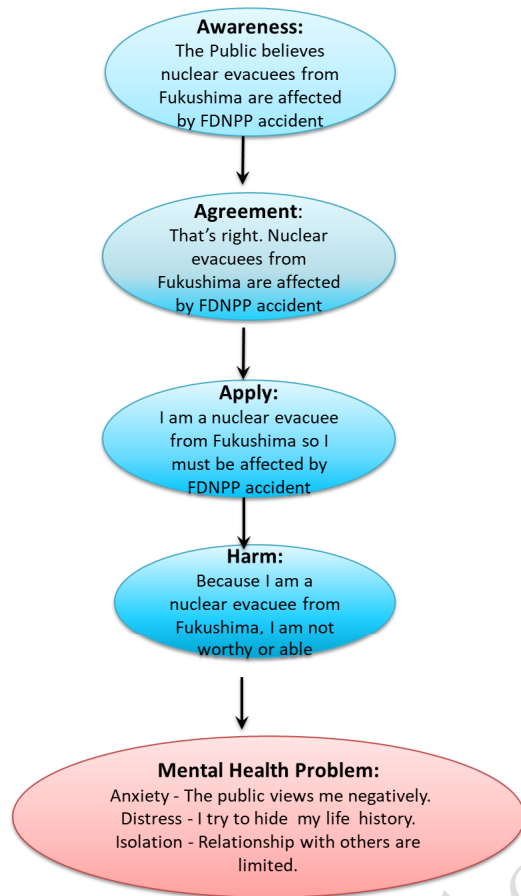


Figure legend

FIGURE: The Stage Model of Self-Stigma among nuclear evacuees from Fukushima

This figure is newly made based on “The Stage Model of Self-Stigma” by Corrigan and Rao (2012). If evacuees from Fukushima are aware of public stigma about their condition (“awareness”), then they may agree that these negative public ideas are true about the group (“agreement”). Subsequently, they concur that these stereotypes apply to themselves (“application”). This may lead to significant decreases in self-esteem and self-efficacy (“harm”), resulting in mental health problems such as depression, psychological distress, and isolation.